GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

COURSE CURRICULUM

Course Title: Yarn Manufacturing 1
Course Code: 3322901

Diploma Programmes in which this course is offered	Semester in which offered
Diploma in Yarn Manufacturing Technology 1	Second Semester

1. RATIONALE

Natural fibres—cotton, flax, silk, and wool—represent the major fibres available to us. Cotton accounts for almost 50% of the worldwide consumption of textile fibre. Worldwide cotton production is annually about 80 to 90 million bales (17.4 to 19.6 billion kg). China, the United States, India, Pakistan and Uzbekistan are the major cotton-producing countries, accounting for over 70% of world cotton production. The rest is produced by about 75 other countries. Yarn manufacturing is a sequence of processes that convert raw cotton fibres into yarn suitable for use in various end-products- like- weaving, knitting, lace making, felting, and braiding or plaiting, etc. A number of processes are required to obtain the clean, strong, uniform yarns required in modern textile markets.The industries are competing with technological up gradation and automation to reduce cost, increase quality, increase production, and variety with product mix and colours. More & more knowledge and skills are expected by the industries in fresh pass outs. This course is one such effort to develop knowledge and skills in the area of Blow room process & carding process. Since India is one of the largest manufacturers of yarns, it is must for students to develop competency in this area for getting good employment.

2. COMPETENCY

The course content should be taught and implemented with the aim to achieve different types of skills so that students are able to acquire following competency.

i. **Operate and maintain conventional and modern blow room system and carding machines as per required process parameters of yarn production**.

3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
3	0	4	7	70	30	40	60	200

Legends: L-Lecture; **T** – Tutorial/Teacher Guided Student Activity; **P** -Practical; **C** – Credit;; **ESE** -End Semester Examination; **PA** - Progressive Assessment.

4. DETAILED COURSE CONTENTS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit – I Blow Room	1a. Describe objects, functions, and classification of blow room. 1b. Describe fibres opening technique and m/cs. 1c. Describe cleaners 1d. Explain conventional process of lap making. 1e. Describe various systems in blow room, such as- Dust extraction, metal extraction, Fire elimination, Gravity traps, etc.	1.1Objectives of blow room process. 1.2Classification of Conventional Blow room 1.3Machineries. 1.4Techniques of opening and m/cs. 1.5 Opening m/cs (Brief study)- Hoper bale opener, Blending bale opener, Working of SRRL Opener 1.6 Brief introduction of Step cleaner, Two/Three bladed beater, Krishner beater. Working of Axi flow cleaner, Air stream Cleaner, mono cylinder cleaner, ERM cleaner 1.7 Brief introduction to scutcher m/c with passage of material- Different motion available on scutcher with their objects only 1.8 Brief introduction of Dust extractor, Dust remover, magnetic metal extractors, Fire eliminator, Gravity traps.
Unit– II Mixing	2a. Explain the importance of mixing. 2b. Describe working of auto & multi mixer.	2.1 Object of mixing. 2.2 Methods of mixing with advantage and disadvantages 2.3Working of Auto mixer m/c, Multi mixer
Unit–III Latest development in blow room line and performance of Blow room.	3a. Describe modern developments in blow room. 3b. Describe the cotton contamination, clearer m/cs. 3c. Explain various parameters for better quality.	3.1Modern blow room line 3.2Cotton contamination 3.3Device for contamination clearer 3.4 Cleaning efficiency and its method of estimation
Unit-IV Carding Machine.	4a. Describe objectives, functions, working principle and process parameters of the carding machine. 4b. Explain construction of flat carding machine. 4c. Explain importance of stripping and grinding and its impact on quality.	4.1 Objectives of carding process. 4.2 Passage of material through Carding machine. 4.3 Various parts of Revolving Flat Carding machine. 4.4 Stripping and grinding with integrated grinding system. (IGS on Rieter machine.)
Unit– V Modern developments	5a. Describe modern feeding system 5b. Explain	5.1 Principle and concept of chute feed to card, advantage and limitation, Different types of chute feeding system.

Unit	Major Learning Outcomes	Topics and Sub-topics
in carding machine.	developments in cards. 5c. Describe the principle types, and working of auto leveller.	5.2 Construction and modern developments in carding machines-Licker-in zone. Unidirectional feed, Carding segments, Stationary flats, Carding action between cylinder and flats, Doffer zone, Card clothing (metallic wire) 5.3 Basic principle of auto leveler, Types of auto leveler, Working of auto leveler
Unit– VI Assessment of performance of card & Production calculation	6a. Describe various parameters for better quality of card production. 6b. Calculate the production based on machine capacity.	6.1 Quality Parameters-Card settings and their effects, Cleaning efficiency & neps removal efficiency of card, Cause and remedies of neps, Card waste study. 6.2 Production calculation for Blow room and carding

5. SUGGESTED SPECIFICATION TABLE WITH HOURS & MARKS (THEORY)

Unit No.	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total
I	Blow Room	12	5	5	10	20
II	Mixing	03	2	2	2	06
III	Latest development in blow room line and performance of Blow room.	07	0	6	6	12
IV	Carding Machine.	11	3	3	9	15
V	Modern developments in carding machine.	05	0	4	6	10
VI	Assessment of performance of card & Production calculation.	04	0	3	4	07
	Total	**42**	**18**	**18**	**34**	**70**

Legends: R = Remember; U= Understand; A= Apply and above levels (Bloom's revised taxonomy)

Note: This specification table shall be treated as only general guideline for students and teachers. The actual distribution of marks in the question paper may vary from above table.

6. SUGGESTED LIST OF EXERCISES/PRACTICALS:

The practical and industry visits should be properly designed and implemented with an attempt to develop different types of skills so that students are able to acquire above mentioned competency.

S. No.	Unit No.	Practical/Exercise	Approx Hours Required
1	**I**	Visit a conventional blow room and study sequence and operation of machinary	08
2	**II**	Visit a industry to study of passage of material through modern blow room	08
3	**III**	Visit to understand chute feeding system.	04
4	**IV**	Observe passage of material through carding machine.	04
5	**V**	Observe grinding process & its impact of quality	06
6	**VI**	Observe stripping process & its impact of quality	06
7	**VII**	Perform card setting affecting waste and quality of sliver.	10
8	**VIII**	Visit wire mounting process in card .	02
9	**IX**	Analyse card waste.	08
		Total	**56**

7. SUGGESTED LIST OF PROPOSED STUDENT ACTIVITIES

Following is the list of proposed student activities like: course/topic based seminars, internet based assignments, teacher guided self learning activities, course/library/internet/lab based mini-projects---etc.

i. Internet based assignment topic wise.
ii. Collection of various parameters of blow room line and card from industries. (Lmw, Rieter, Trutzscheler.)

8. SUGGESTED LEARNING RESOURCES

A. List of Books

S. No.	Title of Books	Author	Publication
1	Technology of yarn forming	S.Jayprakasam	
2	Elements of carding and drawing	A.R.Khare	
3	Spun yarn technology	Subramani	
4	Technology of short staple spinning	W.Klein	

B. List of Major Equipment/ Instrument

i. Textile Laboratory –Blow room machines set up, conventional and modern carding machine.

C. List Of Software /Learning Websites

Searching engine could be used to locate textile related sites

i. http://www.textileassociationindia.org/
ii. http://www.nitma.org/
iii. http://www.sitra.org/
iv. www.itamma.org/
v. http://www.uttaindia.org/
vi. http://www.cottonjouney.com/Storyofcotton/page5.asp
vii. http://textiletechinfo.com/spinning/BLOWROOM.htm
viii. http://en.wikipedia.org/wiki/weaving
ix. http://textilelearner.blogspot.in
x. http://website.lineone.net/~davghalgh/cotton_spin.html
xi. http://www.toyota-industries.com/product/textile/textile/made.html

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE

Faculty Members from Polytechnics

- **Prof.Y. M. Gandhi**, HOD Textile Manufacturing, Shri BPTI, Bhavanagar
- **Prof. R.T. Patel**, Lecturer in Textile Manufacturing, RCTI, Ahmedabad
- **Prof. M. H. Vyas**, Lecturer in Textile Manufacturing, RCTI, Ahmedabad
- **Prof. B. B. Bhatt**, Lecturer in Textile Manufacturing, RCTI, Ahmedabad
- **Prof. S. P. Patel** ,Lecturer in Textile Manufacturing, RCTI, Ahmedabad

Co-ordinator and Faculty Members from NITTTR Bhopal

- **Dr. C.K. Chugh**, Professor and head Dept, of Electronic Media
- **Prof. S.K. Gupta,** Professor & Coordinator for Gujarat State